

Title of Invention: Stabilizer, Flotation and Mast Mount Mechanisms and Methods.

Background:

Narrow beamed vessels, such as for example canoes, rowboats, and kayaks, can capsize more easily than other more stable vessels and can benefit from increased stability through the use of one or more flotation device(s) and/or leeboard(s) (keel-like devices) secured to such vessels. Vessels not already equipped with mast and sail apparatus can benefit from the use of mast mounting mechanisms and methods with or without the additional use of one or more flotation device(s) or leeboard(s).

Brief Description of the Drawings:

Figure 1 depicts one embodiment of the present invention having several components arranged in relation to each other.

Figure 2 depicts another embodiment of the present invention having several components arranged in relation to each other.

Figure 3 depicts another embodiment of the present invention having several components arranged in relation to each other.

Figure 4 depicts another embodiment of the present invention having several components arranged in relation to each other.

Figure 5 depicts an example of hinge device(s) or other interfacing portion(s) of the present invention.

Figure 6 depicts an example of hinge device(s) or other interfacing portion(s) of the present invention.

Figure 7 depicts an example of hinge device(s) or other interfacing portion(s) of the present invention.

Figures 8A through 8E depict examples of member components of the present invention.

Figure 9 depicts an example of mechanisms for securing portions of the present invention to a vessel.

Figure 10 depicts an example of mechanisms for securing portions of the present invention to a vessel.

Figure 11 depicts an example of a mounting device with members arranged in relation to such base mounting device.

Figure 12 depicts an example of a mounting device.

Figure 13 depicts an example of a mounting device.

Figure 14 depicts an example of a mounting device.

Figures 15A and 15B depict examples of mast mount devices.

Detailed Description:

One embodiment of the present invention as illustrated in Figure 1 incorporates two or more elongated member(s) 1 capable of extending outward toward or over the gunnel(s) 2 of a vessel and connected or capable of being connected to each other within or over the vessel by way of one or more hinge device(s) or other interfacing portion(s) 3 capable of being arranged or positioned in multiple positions and fixed in place. The two or more members may extend beyond the gunnel(s) of the vessel and down past the waterline and may be straight, curved or have one or more angled portions incorporated therein and may optionally have one or more flotation device(s) 4 affixed to one or more of them and may each, optionally, have at one end a flattened portion 5 that serves as a leeboard. Such members may have one or more raised or indented portions or holes or apertures or other structures suited to securing such member(s) to each other, to flotation devices or to the vessel using various techniques, mechanisms or devices.

Another embodiment of the present invention as illustrated in Figure 2 incorporates two or more member(s) 6 capable of extending outward toward or over the gunnel(s) 7 of a vessel and connected or capable of being connected to each other within or over the vessel by way of one or more hinge device(s) or other interfacing portion(s) 8 capable of being arranged or positioned in multiple positions and fixed in place. The member(s) or leeboard member(s) of this or

any other embodiment may have one or more raised or indented portions or holes or apertures suited to securing such member(s) or leeboard member(s) to each other, to flotation devices or to the vessel using various techniques, mechanisms or devices. The ends of one or more members of this embodiment positioned toward or over the vessel gunnel(s), or portion(s) near to such end(s), is/are each further attached to a leeboard member **9** by way of one or more hinge device(s) or other interfacing portion(s). One or more leeboard members may alternatively be fixed in place to one or more member(s) by alternate methods, many of which are known to those having ordinary skill in the art. A leeboard member **9** for this or any other embodiment of the present invention may include as a component or have affixed to it one or more hinge device(s) or other interfacing portion(s) such that such leeboard member may be connected to one or more other member(s) in multiple positions and fixed in place. A leeboard member **9** for this or any other embodiment of the present invention may have a flattened fin-like portion at one end. The terms "member" and "elongated member" as used herein are intended to be interchangeable and to encompass members and leeboard members. The term "leeboard member" represents a subset of members or elongated members having a portion shaped like a leeboard. Leeboards are known generally in the art to be devices that can be extended into the water and which serve a function similar or analogous to the keel or daggerboard of a sailboat. The fin shaped portion of the leeboard may be constructed to have various shapes consistent with techniques and knowledge possessed by those having ordinary skill in the art. One or more leeboard member(s) should be capable of being positioned such that it enters the water outside the vessel at least partially when in use. One or more leeboard member(s) **9** for this or any other embodiment of the present invention may optionally have one or more flotation device(s) **10** affixed to it or them. The ability to adjust and fix the relative position of the members to each other and/or the leeboard(s) to the member(s) it/they are affixed to allows the user to adjust the device to fit the shape of the vessel it is being used with and to optimize the effectiveness of the leeboard members(s). For leeboard members having hinge

device(s) or other interfacing portion(s) suited to positioning the leeboard member(s) back over or under or against the member(s) they are affixed to, such positioning can permit useful out of the way storage when the leeboard member(s) are not in use. The ability to adjust and fix the relative position of the members to each other and/or the leeboard(s) to the member(s) it/they are affixed to allows the user to adjust the device to maximize the positioning and effectiveness of any attached flotation device(s) for providing flotation and stability when in use.

Another embodiment of the present invention as illustrated in Figure 3 incorporates two or more member(s) 11 capable of extending outward toward or over the gunnel(s) 12 of a vessel and connected or capable of being connected to each other within or over the vessel by way of one or more hinge device(s) or other interfacing portion(s) 13 capable of being arranged or positioned in multiple positions and fixed in place. The ends of one or more members of this embodiment positioned toward or over the vessel gunnel(s) is/are each further attached to another member 11 by way of one or more hinge device(s) or other interfacing portion(s) 13 which member(s) 11 is/are additionally attached to a leeboard member 14 by way of one or more hinge device(s) or other interfacing portion(s). One or more leeboard member(s) 14 for this or any other embodiment of the present invention may optionally have one or more flotation device(s) 15 affixed to it or them. Any number of member(s) may be connected to each other in series and connected to one or more leeboard member(s) using one or more hinge device(s) or other interfacing portion(s) or other connecting methodologies. For all embodiments of the present invention members may have varied characteristics such as size or shape and need not be similar to other members used within the same embodiment.

Another embodiment of the present invention as illustrated in Figure 4 incorporates two or more member(s) 16 capable of extending outward toward or over the gunnel(s) 17 of a vessel and connected or capable of being connected

to each other within or over the vessel by way of one or more hinge device(s) or other interfacing portion(s) 18 capable of being arranged or positioned in multiple positions and fixed in place. The ends of one or more members of this embodiment positioned toward or over the vessel gunnel(s) is/are each further attached to one or more additional member(s) 16 by way of one or more hinge device(s) or other interfacing portion(s) 18 at least one of which member(s) 16 is/are additionally attached to a flotation device 19. Any number of member(s) may be connected to each other in series and connected to one or more leeboard member(s) using one or more flotation device(s) or other interfacing portion(s) or other connecting methodologies.

Examples as illustrated in Figure 5, 6 and 7 of hinge device(s) or other interfacing portion(s) for any embodiment of the present invention or any component thereof would be one or more rounded, circular, oval, square, rectangular, triangular, pentangular, hexagonal, septangular, octagonal, crescent, semicircle or otherwise shaped structures (affixed or affixable to or incorporated as a structure or part of one or more member(s) or leeboard member(s) or other portions, such as mounting device(s) or mast mount device(s), of this or other embodiment(s) of the present invention) and having one or more hole(s) or apertures therein such that two or more of such hinge device(s) or other interfacing portion(s) or portions thereof may be positioned next to each other and bolted, clipped or otherwise affixed together in a manner that fixes or reversibly fixes the relative position of associated member(s) or leeboard members or other portion(s). A wide variety of hinge device(s) or other interfacing portion(s) known to person having ordinary skill in the art may be employed as well.

The expression hinge device(s) or other interfacing portion(s) is intended to comprise portions of one or more members individually or in combination with portions of one or more other members. The expression hinge device(s) or other interfacing portions is also intended to encompass distinct devices or structures affixable to one or more members. For all embodiments of the present

invention it is contemplated that different or varying hinge device(s) or other interfacing portion(s) may be used in conjunction with each other such that no one embodiment is limited to using just one type of hinge device(s) or other interfacing portion(s).

The hinge device(s) or interfacing portion(s) illustrated in Figure 5 has/have two components **20** and **22** with each such component having a flat side and apertures **21** and **23** through which bolts or other securing devices could be inserted. The apertures **21** and **23** are aligned relative to each other such that the two components may be secured together in two or more positions. The components **20** and **22** have a rounded shape.

The hinge device(s) or interfacing portion(s) illustrated in Figure 6 has/have two matching components **24** on one member and two matching components on another member **26** with each such component having a flat side and apertures **25** and **27** through which bolts or other securing devices could be inserted. The apertures **25** and **27** are aligned relative to each other such that the two components may be secured together in two or more positions. The components **24** and **26** have a rounded shape.

The hinge device(s) or interfacing portion(s) illustrated in Figure 7 has/have two components **28** and **29** with each such component having a flat side and apertures **30** and **31** through which bolts or other securing devices could be inserted. The apertures **30** and **31** are aligned relative to each other such that the two components may be secured together in two or more positions. The end portions of the components **28** and **29** have a curved or crescent shape.

Another hinge device(s) or interfacing portion(s) example would have two components with each such component having a flat side and apertures through which bolts or other securing devices could be inserted. The end portion of one component having a curved or crescent shape while the other component is

more narrow in dimension than the other component and has a rectangular shape. The apertures would be alignable relative to each other such that the two components may be secured together in two or more positions.

Examples of suitable flotation devices for any embodiment of the present invention would be one or more pontoon(s) or elongated foam flotation buoys or structures, such as bullet shaped lobster buoys. A wide variety of flotation devices known to person having ordinary skill in the art may be employed as well. The flotation devices may be affixed in this or other embodiments of the invention using techniques known to those having ordinary skill in the art such as bolting, clipping, or tying and may involve various positioning of the flotation device(s) such as, for example having the leeboard portion or other portion of this or another embodiment of the invention inserted through one or more apertures in the flotation device prior to the flotation device being secured in place.

The one or more member(s) of the several embodiments of the present invention may have varying shapes, sizes, widths, lengths, or other dimensions or features or components and may be constructed of various materials. An example of a member as illustrated in Figure 8A is an elongated rectangular bar 32 having hinge device(s) or other interfacing portion(s) 33 extending outward from each corner of the shorter sides of the rectangular bar. Another example of a member as illustrated in Figure 8B is an elongated rectangular bar 34 having rounded corners and one hinge device or other interfacing portion 35 extending outward from each of the shorter sides of the rectangular bar. Another example of a member as illustrated in Figure 8C is an elongated rectangular bar 36 that is thicker near its edges than at its center and having hinge device(s) or other interfacing portion(s) 37 extending outward from each corner of the shorter sides of the rectangular bar. Another example of a member as illustrated in Figure 8D has an elongated rectangular structure 38 that is solid near its edges with its center having one or more apertures 39 and one or more support structure(s) 40 internal to its edges and such member having hinge device(s) or other interfacing

portion(s) 41 extending outward from each corner of the shorter sides of the rectangular bar. An example of a leeboard member as illustrated in Figure 8E is an elongated rectangular structure 42 having hinge device(s) or other interfacing portions 43 at one end, a flattened portion 44 at the other end and one or more aperture(s) 45 suitable for securing one or more flotation device(s) thereto. The cross-section of portions of the one or more members, such as portions near the edges, may have a wide variety of shapes, sizes, widths, lengths, or other dimensions or features and may, for example, have a "T" shape, an "X" shape, an "L" shape or be of a round, square, triangular, or hexagonal solid or tubular shape and may be of other solid or tubular shape(s). The member(s) may additionally have one or more raised or indented portions or holes or apertures or other structures on or in the member(s) or leeboard member(s) that would aid in securing such member(s) to a vessel.

The members of the several embodiments of the invention illustrated herein may be secured to a vessel at one or more of the vessel's gunnels or other locations or structures using numerous methods known to those having ordinary skill in the art.

The members of the several embodiments of the invention illustrated herein may also be secured to the vessel at one or more of the vessel's gunnels or other locations or structures using a mechanism where for example a strap or chord or band or bar is positioned over, under and/or around a member and held in place with a c-clamp or other affixing or securing device or method. One example of such a device as illustrated in Figure 9 is a bar 46 that is contoured to the shape of a member or leeboard member 47 and wider at both ends to prevent it from moving or sliding relative to the c-clamp or other securing device 48 which is secured, for example, to the gunnel of a vessel 49. Another example of such a device is a strap or chord that is slightly longer than a member is wide and has affixed to both ends a portion sufficiently wide to prevent it from moving or sliding relative to a c-clamp or other securing device. Another example of such a device

is a strap or chord that is approximately as long as a member is wide and has affixed to one or both ends a ring or clip or similar structure that can be affixed to a c-clamp or other securing device. Another example of such a device is a strap that is long enough to wrap completely around a member or leeboard member and has affixed to one or both ends a ring or clip or similar structure that can be affixed to a c-clamp or other securing device. Such mechanism where a strap or chord or band or bar is positioned over, under and/or around a member and held in place with a c-clamp or other affixing or securing device or method may be aided by such mechanism being put in contact with one or more raised or indented portions or holes or apertures or other structures on or in the associated member(s) or leeboard member(s).

The members of the several embodiments of the invention illustrated herein may also be secured to the vessel at one or more of the vessel's gunnels or other locations or structures using a mechanism where for example a device is secured to the gunnel(s) or other locations or structures using a c-clamp or other affixing device or method and one or more portions (affixing portion(s)) inserted into, through, under, over or around or otherwise contacted with one or more portions of a member or leeboard member suitable for receiving or attaching to such affixing portion(s) and affixed thereto. One example of such a device as illustrated in Figure 10 is a device having a wide base **50** around which a c-clamp or similar device can be placed and an affixing portion **51** arranged like two downwardly extended teeth, which tooth portions could be inserted into holes or apertures within a member or leeboard member prior to securing the c-clamp or similar device to the vessel. Another example of such a device is a device having a wide base around which a c-clamp or similar device can be placed and an affixing portion having one or more apertures, which aperture(s) could be positioned over posts or raised features of a member or leeboard member prior to securing the c-clamp to the vessel. Another example of such a device is a device comprising a chord or strap having a ring or clip at one end and a ring or clip at the other end such that the ring or clip may be placed over a c-clamp or

similar device, the chord may be inserted through or wrapped or tide around or otherwise connected to a feature on the member or leeboard member and the clip may be connected to the ring prior to or after securing the c-clamp to the vessel. Such mechanism where a member or leeboard member is secured to the gunnel(s) or other locations or structures using a c-clamp or other affixing device, such as one or more suction cups, or method and one or more portions that are inserted into, through, under, over or around one or more portions of a member or leeboard member suitable for receiving such affixing portion(s) and affixed thereto may be aided by such mechanism being put in contact with one or more raised or indented portions or holes or apertures or other structures on or in the associated member(s) or leeboard member(s).

The members of the several embodiments of the invention illustrated herein may also be secured to the vessel by way of one or more mounting device(s) having one or more base(s) that can be affixed to or mounted upon the vessel and one or more structure(s) for holding said member(s) or leeboard member(s) in place. The mounting device(s) may be secured to the vessel using techniques known to those having ordinary skill in the art such as for example by bolting the mounting device(s) to the vessel or affixing the mounting device(s) to the vessel using suction cups.

One example of a mounting device as illustrated in Figure 11 has a base **52** configured to be mountable to a vessel, using techniques such as for example bolting or employing suction cups, and one or more portions configured to function as base hinge device(s) or other base interfacing portion(s) **53** comprising one or more rounded, circular, oval, square, rectangular, crescent, semicircle or otherwise shaped structures and having one or more hole(s) therein such that one or more base hinge device(s) or base interfacing portion(s) may be positioned next to (i) one or more hinge device(s) or other interfacing portion(s) on one or more member(s) or leeboard members and/or (ii) one or more hinge device(s) or other interfacing portion(s) on one or more mast mount device(s)

and bolted together in a manner that fixes the relative position of the associated member(s), leeboard member(s) and/or mast mount device(s). A wide variety of base hinge device(s) or other base interfacing portion(s) known to person having ordinary skill in the art may be employed as well. Figure 12 illustrates one possible arrangement of components relative to a mounting device with the hinge device portions **54** of the mounting base **55** aligned next to the hinge device portions **56** of two members. The combination of components may for example be bolted together by sliding bolts through aligned holes or apertures in the hinge device portion of each component. The hinge device portions of a mast mount device may also for example be aligned in between those of members and the combination of components may for example be bolted together by sliding bolts through aligned holes or apertures in the hinge device portion(s) of each component. The full range of possible arrangements and methods of securing the components are contemplated within the present invention.

Another example of a mounting device is generally similar to the above example (as illustrated in Figure 11) but has an individual base for each portion configured to function as a base hinge device or other base interfacing portion. The mounting devices of any of the embodiments of the invention may be used individually or in combination with other mounting devices and positioned as desired on the vessel.

Another example of a mounting device as illustrated in Figure 13 is generally similar to the above example (as illustrated in Figure 11) but has an individual base **57** with one or more base hinge device(s) or other base interfacing portion(s) **58** positioned perpendicular or at other angles to one or more other base hinge device(s) or other base interfacing portion(s) **59**.

Another example of a mounting device as illustrated in Figure 14 has a base **60** capable of being affixed or otherwise secured to a vessel using bolts, suction cups or other devices or methods known to those having ordinary skill in the art

and has at least one raised portion **617** that interfaces with one or more member(s) or leeboard members in a manner similar to one or more vessel gunnel(s). Such a mounting device could function as a support for one or more member(s) or leeboard member(s), or as a structure to which one or more member(s) or leeboard member(s) is/are secured to or could function in conjunction with or as part of another mounting device. Such a mounting device would represent an example of such other location(s) or structure(s) to which one or more member(s) or leeboard member(s) may be secured to. Another example of such a mounting device has a base and a single raised portion.

Embodiments of the present invention involve securing one or more mast mounting device(s) to one or more member(s) or leeboard member(s) or mounting device(s) or combinations thereof so as to provide a mechanism for mounting or stepping a mast or other structure or device for use for example in sailing a vessel with or in the absence of any one or combination of components comprising the present invention in any of its embodiments. Mast mounting devices may be as simple as incorporating a hole or aperture within a mounting device for receiving a mast or similar structure or more complex. Mast mounting devices may also be tailored to securing other devices such as one or more fishing rod(s) or fishing rod holder(s), canopy support structure(s), or compass, beverage or cellular telephone or other device or instrumentation holder(s).

An examples of a mast mounting device as illustrated in Figure 15A includes a base **62** having one or more hinge device(s) or similar movable interface portion(s) **63** and a support structure **64** extending from or secured to such one or more hinge device(s) or similar movable interface(s) and to which a mast or other compatible structure may be mounted using u-bolt(s), clamp(s), strap(s) or other suitable device(s) or mechanism(s).

An examples of a mast mounting device as illustrated in Figure 15B includes a hinge device or similar movable interface portion **64** incorporated into a support

structure 65 to which a mast or other compatible structure may be mounted using u-bolt(s), clamp(s), strap(s) or other suitable device(s) or mechanism(s).

One embodiment of the present invention involves a mounting device configured to be mounted to a vessel such that two base hinge devices or other base interfacing portions are positioned parallel to the stern of the vessel and two more base hinge devices or other base interfacing portions are positioned perpendicular to the other two base hinge devices or other base interfacing portions. The two base hinge devices or other base interfacing portions positioned parallel to the stern in this embodiment are each secured to the hinge devices or interface portions of two members with each member extending outward toward or over a gunnel of the vessel and which members are each secured to a leeboard member (with or without an attached flotation device). The leeboard members in this embodiment may each be positioned such that the flattened fin portion of either or both extends into the water outside the vessel or folded back on top of or below its respective member when not in use. In this embodiment a mast mount device having two hinge devices or other base interfacing portions is secured to the two base hinge devices or other base interfacing portions positioned parallel to the stern of the vessel such that the mast mount device may be positioned and secured in various positions from approximately horizontal forward toward the bow of the vessel to vertical to approximately horizontal toward the stern of the vessel with or without a mast and/or sail secured therein or thereto. This embodiment may be used for example by mounting the mounting device to a vessel and securing the components as indicated with the leeboard members (with or without one or more attached flotation devices) folded over the top of their respective member(s), securing a mast with sail to the mast mount device (the sail may be secured to the mast before or after securing the mast to the mast mount device) and positioning the mast device approximately horizontal forward toward the bow of the vessel and then when desired repositioning and securing one or both leeboard members such that the flattened fin portion(s) enter the water outsid

the vessel and then repositioning and securing the mast mount device such that the mast is vertical and the sail may be used. The sequence of steps may be reversed, carried out in one or more different order(s) or carried out in one or more different reverse order(s) as desired or modified to accommodate the use of the various embodiments of the present invention. The sequence of steps may be similarly carried out, reversed, carried out in one or more different order(s) or carried out in one or more different reverse order(s) as desired or modified to accommodate the use of the various embodiments of the present invention, for example embodiments having more than one base device, an alternate number of base hinge devices or other base interfacing portions, an alternate number of members or an alternate number of hinge devices or interface portions on one or more members or leeboard members.

Another embodiment of the present invention involves two members secured to each other by way of their respective hinge devices or interface portions and each extending outward such that they may each be secured to a gunnel of a vessel using one or more devices described herein and each member being further secured via hinge devices or interface portions to a leeboard member (with or without an attached flotation device). The leeboard members in this embodiment may each be positioned such that the flattened fin portion of either or both extends into the water outside the vessel or folded back on top of or below its respective member when not in use. In this embodiment a mast mount device having a hinge device or interfacing portion is secured to two hinge devices or other base interfacing portions used to secure the two members to each other such that the mast mount device will be generally vertical when the members are secured to the gunnels of the vessel. This embodiment may be used for example by securing the components as indicated to each other and also to the vessel with the leeboard members (with or without one or more attached flotation devices) folded over the top of their respective member(s), storing a mast with sail to the mast mount device (the sail may be secured to the mast before or after securing the mast to the mast mount device) within or upon

the vessel and then when desired repositioning and securing one or both leeboard members such that the flattened fin portion(s) enter the water outside the vessel and then securing the mast to the mast mount device such that the mast is vertical and the sail may be used. The sequence of steps may be reversed, carried out in one or more different order(s) or carried out in one or more different reverse order(s) as desired and modified to accommodate the use of the various embodiments of the present invention. The sequence of steps may be similarly carried out, reversed, carried out in one or more different order(s) or carried out in one or more different reverse order(s) as desired or modified to accommodate the use of the various embodiments of the present invention, for example embodiments having an alternate number of members or an alternate number of hinge devices or interface portions on one or more members or leeboard members.

The descriptions and examples of embodiments of the invention provided herein are intended to be illustrative and not to in any way limit the scope of the invention.